



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,250	05/12/2006	Hee-Joo Jcon	NEK-0031	7111

23413 7590 09/21/2007  
CANTOR COLBURN, LLP  
55 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002

EXAMINER
----------

CHEUNG, WILLIAM K

ART UNIT	PAPER NUMBER
----------	--------------

1713

MAIL DATE	DELIVERY MODE
-----------	---------------

09/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/579,250

Applicant(s)

JEON ET AL.

Examiner

William K. Cheung

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/5/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The examiner acknowledges the receipt of the amendment filed July 5, 2007.

Claims 1-26 are pending.

2. In view of the amendment filed July 5, 2007, the rejection of Claims 1, 2 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tachibana et al. (US 4,035,563) as evident by Gloesener et al. (US 5,214,092), is withdrawn.

3. In view of new rejection, the allowability of Claims 3-26 is withdrawn.

### ***Claim Objections***

4. Claim 8 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 8 is setting up a multiple dependency of claims 3-4.

However, claims 3-4 are also a multiple dependent claims 5-7. See MPEP § 608.01(n).

Art Unit: 1713

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1-9, 11-18, 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachibana et al. (US 4,035,563) as evident by Gloesener et al. (US 5,214,092) in view of the product literature of Fujian Sannong Calcium Carbonate Co., on Nano calcium carbonate (1993).

*The invention of claims 1-8 relates to a nano calcium carbonate/vinyl chloride monomer dispersion comprising:*

*a vinyl chloride monomer;*

*nano calcium carbonate; and*

***a lipophilic dispersing agent, which comprises 1-30 parts by weight of nano calcium carbonate per 100 parts by weight of the vinyl chloride monomer.***

***The invention of claims 9-17 relates to a method for preparing a PVC based nanocomposite resin composition comprising the steps of:***

***(a) adding nano calcium carbonate and a lipophilic dispersing agent to a vinyl chloride monomer to disperse them;***

***(b) adding the resultant mixture system to an aqueous solution system comprising deionized water, a suspension stabilizer and a polymerization initiator to prepare a suspension system and polymerizing the suspension system at an elevated temperature to prepare a PVC based nanocomposite resin composition; and***

***(c) processing the PVC based nanocomposite resin composition including an impact modifier to produce extruded articles.***

***The invention of claims 18-26 relates to a method for preparing a PVC based nanocomposite resin composition comprising the steps of:***

Art Unit: 1713

*(a) adding nano calcium carbonate, a lipophilic dispersing agent and a polymerization initiator to a vinyl chloride monomer to disperse them;*

*(b) adding the resultant mixture system to an aqueous 25 solution system comprising deionized water and a suspension stabilizer to prepare a suspension system and performing polymerization at an elevated temperature to prepare a PVC based nanocomposite resin composition; and*

*(c) processing the PVC based nanocomposite resin composition including an impact modifier to produce extruded articles.*

Tachibana et al. (col. 5, line 15-47) disclose a process for preparing a dispersion comprising adding a water soluble metallic salt, which include calcium carbonate as a water soluble metallic salt. Although Tachibana et al. disclose that amount of calcium carbonate used is 100 ppm to water, when the such concentration of calcium carbonate solution is added to the vinyl chloride monomers with other ingredients such as methanol, initiator (col. 1, line 12) and suspension stabilizer (col. 1, line 12), which would lower the solubility characteristics of calcium carbonate in water, causing the calcium carbonate to precipitate. As evident in Gloesener et al. (col. 2, line 67 to col. 3, line 2), the precipitation of calcium carbonate is an easy method for making nano-size particles of calcium carbonate. In view of the evidence of Gloesener et al., the examiner has a reasonable basis to believe that the process of Tachibana et al. also involve the precipitation of the calcium carbonate while preparing a mixtures comprising vinyl

Art Unit: 1713

chloride monomers in the presence of lipophilic dispersing agents. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Regarding the claimed lipophilic dispersion agents, Tachibana et al. (col. 1, line 12) clearly disclose the use of suspension stabilizer as well as initiator. Tachibana et al. (col. 8, claim 5) disclose the use of partially saponified polyvinyl alcohol (or polyvinyl acetate), cellulose, gelatin, and tricalcium phosphate.

The difference between the invention of claims 1-9, 11-18, 20-26 and Tachibana et al. is that Tachibana et al. are silent on a composition comprising 1-30 parts by weight of nano calcium carbonate per 100 parts by weight of vinyl chloride monomer.

However, the product literature of Fujian Sannong Calcium Carbonate Co., on Nano calcium carbonate (1993) teaches that nano calcium carbonates are suitable as filler for polyvinyl chloride polymers. Therefore, motivated by the expectation of success of obtaining a polyvinyl chloride filled with nano calcium carbonate for PVC cable applications, which are products formed by extrusion processes, it would have been obvious to one of ordinary skill in art to incorporate the filler teachings and the extrusion teachings of the product literature of Fujian Sannong Calcium Carbonate Co., into Tachibana et al. to obtain the invention of claims 1-9, 11-18, 20-26.

Art Unit: 1713

7. Claims 10, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachibana et al. (US 4,035,563) as evident by Gloesener et al. (US 5,214,092) in view of the product literature of Fujian Sannong Calcium Carbonate Co., on Nano calcium carbonate (1993), further in view of Kumaki et al. (US 2002/0188077).

In view of paragraph 6 of instant office action, the invention of claims 10, 19 is very similar to the PVC composition taught in Tachibana et al.

The difference between the invention of claims 10, 19 and Tachibana et al. is that Tachibana et al. do not teach a PVC composition that has been toughened with chlorinated polyethylene.

However, Kumaki et al. (0002) clearly teach the use of PVC for making cable. Further, Kumaki et al. (0004) clearly teach the use of chlorinated polyethylene as impact modifier for PVC. Therefore, motivated by the expectation of success of obtaining PVC cable with improved toughness properties, it would have been obvious to one of ordinary skill in art to incorporate chlorinated polyethylene into the PVC composition of Tachibana et al. to obtain the invention of claims 10, 19.



Art Unit: 1713

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
William K. Cheung, Ph. D.

Primary Examiner

September 16, 2007

**WILLIAM K. CHEUNG  
PRIMARY EXAMINER**